



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

Cal

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/851,461	05/08/2001	Hung-Hsiang Jonathan Chao	Poly-17/APP	3632
26479	7590	04/04/2006	EXAMINER	
STRAUB & POKOTYLO 620 TINTON AVENUE BLDG. B, 2ND FLOOR TINTON FALLS, NJ 07724			MURPHY, RHONDA L	
			ART UNIT	PAPER NUMBER
			2616	

DATE MAILED: 04/04/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/851,461

Applicant(s)

CHAO ET AL.

Examiner

Rhonda Murphy

Art Unit

2616

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 January 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-33 and 35 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 17-33 is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 August 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. This communication is responsive to the amendment filed on 1/17/06.

Accordingly, claims 1-33 and 35 are currently pending in this application.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claim 1 is rejected under 35 U.S.C. 102(e) as being anticipated by Hughes et al. (US 6,747,971).

Regarding claim 1, Hughes teaches method for use in a multi-stage switch including a plurality of central modules (Fig. 3, modules 309a-309h), and a plurality of input modules (ingress ports 304a-304n), each including virtual output queues (312a-312n and 313) and outgoing links coupled with each of the plurality of central modules (shown as links between ingress ports and modules 309; see Fig. 3), for scheduling the dispatch of cells stored in the virtual output queues (col. 2, lines 52-55), the method comprising: a) matching a non-empty virtual output queue of an input module with an outgoing link in the input module (col.6, lines 64-67; col. 7, lines 1-4); and b) matching

Art Unit: 2616

the outgoing link with an outgoing link of one of the central modules (col.6, lines 64-67; col. 7, lines 1-4), wherein high switch throughput can be achieved without speedup of the central modules (col. 7, lines 16-30; each central module contains a scheduler, therefore high switching throughput is achieved using parallel processing, without speedup).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 2 – 5, 7 – 14, 16 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hughes et al., in view of Dally et al. (US 6,285,679).

Regarding claim 2, Hughes teaches the act of matching a non-empty virtual output queue of an input module with an outgoing link in the input module includes: i) broadcasting (col. 3, lines 66-67; col. 4, lines 1-2) a request for the non-empty virtual output queue to an arbiter (Fig. 3, request controller 314) for each of the outgoing links of the input module (col., lines 41-44); ii) selecting, with the arbiter the outgoing links of the input module, a non-empty virtual output queue that broadcast a request (col. 4, lines 24-26); iii) sending a grant to an arbiter for the selected non-empty virtual output queue (col. 4, lines 26-28); and iv) selecting, with the arbiter of the selected non-empty

virtual output queue, an outgoing link from among the one or more outgoing links that sent a grant (col. 4, lines 28-30).

Hughes fails to explicitly disclose an arbiter for each of the outgoing links.

However, Dally teaches an arbiter for each of the outgoing links of the input module (Fig. 9, arbiter 68).

In view of this, it would have been obvious to one skilled in the art to modify Hughes method by incorporating arbiters at each outgoing link, so as to provide a fair arbitration process for access to requested output links.

Regarding claims 3 and 12, Hughes teaches the act of matching a non-empty virtual output queue of an input module with an outgoing link in the input module occurs within one cell time slot (col. 6, lines 54-58, 63-67).

Regarding claims 4 and 13, the combined method of Hughes and Dally teach the act of selecting, with the arbiter of each of the outgoing links of the input module, a non-empty virtual output queue that broadcast a request, is done in accordance with a round robin discipline (col. 3, lines 44-47).

Regarding claims 5 and 14, Hughes teaches the act of selecting, with the arbiter of each of the outgoing links of the input module, a non-empty virtual output queue that broadcast a request, is done in based on the location of a pointer updated in accordance with a round robin discipline through each of the virtual output queues of the input module (col. 18, lines 3-10).

Regarding claims 7 and 16, Hughes teaches the same limitations described in the rejection of claim 2 and further teaches performing the acts at least twice within one cell time slot (col. 6, lines 27-33).

Regarding claim 8, Hughes teaches the act of matching the outgoing link of the input module with an outgoing link of one of the central modules includes: i) broadcasting a request for the outgoing link of the input module to an arbiter of the outgoing links of the central modules that lead towards an output port associated with the virtual output queue matched with the outgoing link of the input module (col. 7, lines 16-24); ii) selecting with the arbiter of each of the outgoing links of the central modules, an outgoing link of an input module that broadcast a request (col. 8, lines 10-12); and iii) sending a grant to the selected outgoing link of the input module (col. 7, lines 44-47).

Hughes fails to explicitly disclose an arbiter for each of the outgoing links.

However, Dally teaches an arbiter for each of the outgoing links of the input module (Fig. 9, arbiter 68).

In view of this, it would have been obvious to one skilled in the art to modify Hughes method by incorporating arbiters at each outgoing link, so as to provide a fair arbitration process for access to requested output links.

Regarding claim 9, the combined method of Hughes and Dally teach the act of selecting with the arbiter of each of the outgoing links of the central module, an outgoing link of the input module that broadcast a request, is done based on a round robin discipline (col. 3, lines 44-47).

Regarding claim 10, the combined method of Hughes and Dally teach the act of selecting, with the arbiter of each of the outgoing links of the central module, an outgoing link of the input module that broadcast a request, is done in based on the location of a pointer updated in accordance with a round robin discipline through each of the outgoing links of each of the input modules (col. 18, lines 3-8).

Regarding claim 11, Hughes teaches the same limitations as described above in the rejection of claims 1 and 2.

Regarding claim 35, Hughes teaches a method wherein the outgoing link of the input module is associated with an arbiter (Fig. 3).

Hughes fails to explicitly disclose each outgoing link of the input modules associated with an arbiter dedicated to the particular outgoing link.

However, Dally teaches an arbiter dedicated to the particular outgoing link of the input module (Fig. 9, arbiter 68).

In view of this, it would have been obvious to one skilled in the art to modify Hughes method by incorporating arbiters at each outgoing link, so as to provide a fair arbitration process for access to requested output links.

5. Claims 6 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hughes et al., in view of Wicklund (US 6,154,459).

Regarding claims 6 and 15, Hughes teaches a pointer, but fails to disclose a pointer moving through groups of virtual output queues, before moving through virtual output queues within each group.

However, Wicklund teaches a pointer moving through groups of virtual output queues, before moving through virtual output queues within each group (col. 8, lines 10-24).

In view of this, it would have been obvious to one skilled in the art to modify Hughes method, by including a pointer moving through groups of queues before moving through queues within each group, in order to provide a more efficient means of granting a request to increase throughput.

Allowable Subject Matter

6. Claims 17-33 are allowed.

Prior art fails to disclose means for matching a non-empty virtual output queue of the input modules with an outgoing link in the input module; and means for matching the outgoing link of the input module with an outgoing link of one of the central modules.

Applicant invokes 35 USC 112, 6th paragraph and prior art does not have the same structure as the instant application.

Response to Arguments

7. Applicant's arguments in regards to claim 1 have been fully considered but they are not persuasive. In regards to claim 1, applicant states on page 14 of the amendment "it does not match the outgoing link with an outgoing link of one of the central modules". However, the Examiner interprets the claim as the outgoing link from the ingress ports (see Fig. 3) connecting to an outgoing link of the central module (309), which is

performed by the scheduler. This matching of the links is a known function of the scheduler, in which the outgoing links are connected to outgoing links of the central module, in order to transmit information through the switch fabric and further to the egress port. The currently written claims do not depart from the teaching of the Hughes reference. Furthermore, the applicant argues that the Hughes reference does not teach high throughput achieved without speedup at the central modules. Examiner respectfully disagrees since Hughes describes a process without speedup and further, official notice is taken that high switch throughput can be achieved without speeding up the central modules. The examiner maintains the rejection since the claims as written, still reads upon the Hughes reference.

Conclusion

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

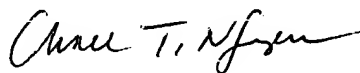
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rhonda Murphy whose telephone number is (571) 272-3185. The examiner can normally be reached on Monday - Friday 8:00 - 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chau Nguyen can be reached on (571) 272-3126. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Rhonda Murphy
Examiner
Art Unit 2616

RM



CHAU NGUYEN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600